

REMARKS

The above amendments and these remarks are responsive to the Office Action issued on July 15, 2004. By this response, claims 1, 3, 13, 14, 16, 17 and 19 are amended, and claim 11 is cancelled without prejudice. Claims 26-28 are newly presented. No new matter is added. Claims 1-10 and 12-28 are now active for examination.

The Office Action

The Office Action dated July 15, 2004 rejected claims 1-9, 12,13 and 17-25 under 35 U.S.C. §103(a) as being unpatentable over Jackson (U.S. Patent No. 5,724,743) in view of Butler (U.S. Patent No. 4,718,759). Claim 10 was rejected under 35 U.S.C. §103(a) as being unpatentable over Jackson and Butler, and further in view of Stam et al. (U.S. Patent No. 5,923,027). Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Jackson and Butler, and further in view of Admitted Prior Art. Claims 14-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jackson and Butler, and further in view of Mathes et al. (U.S. Patent No. 4,457,172). The Examiner objected to the drawings, the specification and claims 14 and 16 for formality reasons.

It is respectfully submitted that the rejections are overcome and the objections are addressed, in view of the amendments and remarks presented herein.

The Rejection of, and Objection related to, Claim 11 Are Moot

By this Response, claim 11 is cancelled without prejudice. Therefore, the rejection of, and objection related to, claim 11 are now moot.

The Objections Are Addressed

The Office Action objected to claims 14 and 16 for including clerical errors. Specifically, the Examiner indicated that claim 14 lacks a period mark at the end of the claim, and claim 16 should be depending on claim 15, rather than claim 1.

By this Response, claim 14 is amended to correct the clerical error and claim 16 is amended to depend from claim 15. It is believed that claims 14 and 16 are now in appropriate form for examination.

The drawings were objected to for including various reference numbers that were not described in the specification, or for failing to include reference characters or symbols mentioned in the written description. The drawings were also objected to for using the same reference numeral to describe two different items. In addition, the Office Action objected to the written description for including clerical errors.

By this Response, Figs. 2 and 3 are amended to provide correct reference numerals. Replacement drawings for Figs. 2 and 3 are attached hereto. Furthermore, the written description is amended to correct clerical errors as indicated in the Office Action, and to remove unnecessary reference numbers. It is respectfully submitted that the drawings and the written description are now in proper form.

The Obviousness Rejection Based on Jackson and Butler Is Overcome

Claims 1-9, 12, 13 and 17-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jackson in view of Butler. By this Response, claims 1, 13 and 17 are amended. It is respectfully submitted that the obviousness rejection is overcome because Jackson and Butler cannot support a prima facie case of obviousness.

Independent claim 1, as amended, recites:

A three-dimensional camera based position determination system, comprising:
an optically scannable target device fixedly attached to a target object;

...

an image sensing device configured to view the optically scannable target device and to generate image information indicative of geometric characteristics of the target device; and

at least one invisible light emitting diode...configured to emit strobed invisible light thereby illuminating the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target;

a data processing device...being configured to determine the orientation of the target object based on the generated target image; and

a visible indicator that indicates whether the at least one invisible light emitting diode is operative.

Therefore, a system according to claim 1 uses at least one invisible light emitting diode to illuminate the target device. A visible indicator, such as a diode emitting light within visible spectrum, is provided to indicate whether the at least one invisible light emitting diode is operating properly.

Appropriate support for the amendment can be found in, for example, Figs. 6 and 7; and paragraphs [0035], [0068] and [0072].

Neither Jackson nor Butler discloses a visible indicator for indicating whether an at least one invisible light emitting diode is operating properly, as described in claim 1. Jackson merely discusses an image-based alignment system that emits visible light towards targets attached to vehicle wheels, and Butler describes only a wheel alignment system that uses both visible and non-visible light emitting diodes for determining relative positions between wheels. Both Jackson and Butler fail to describe “a visible indicator that indicates whether the at least one invisible light emitting diode is operative,” as recited in claim 1. Therefore, Jackson and Butler, even combined, do not teach every limitation of claim 1. Accordingly, Jackson and Butler cannot support a prima facie case of obviousness. The obviousness rejection of claim 1 based on Jackson and Butler is untenable and should be withdrawn. Favorable reconsideration of claim 1 is respectfully requested.

Independent claim 17 is a means-plus-function claim that includes limitations substantially comparable to those of claim 1. Therefore, the obviousness rejection of claim 17 based on Jackson and Butler also is overcome at least for the same reasons as for claim 1.

Claims 2-9, 11, 12 and 18-25, directly or indirectly, depend on claims 1 and 17, respectively, and incorporate every limitation thereof. Accordingly, the obviousness rejection of claims 2-9, 11, 12 and 18-25 also is overcome for at least the same reasons as for claims 1 and 17, as well as based on their own merits. Favorable reconsideration of claims 2-9, 11, 12 and 18-25 is respectfully requested.

Independent claim 13 also was rejected as being obvious over Jackson in view of Butler. Claim 13, as amended, recites:

A...system, comprising:
 an optically scannable target device...
 an image sensing device configured to view the optically scannable target device and to generate image information indicative of geometric characteristics of the target device;...
 at least one light emitting diode...being configured to emit strobed light thereby illuminating the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target;
 a data processing device...being configured to determine the orientation of the target object based on the generated target image; and
 a target object indicator that displays the status of target acquisition..., wherein the status of target acquisition indicates whether an obtained image of the scannable target device is acceptable.

Thus, a system according to claim 13 provides a target object indicator that displays a status of target acquisition indicating whether an obtained image of the scannable target device is acceptable. Appropriate support for the amendment can be found in, for instance, Figs. 6 and 7; and paragraph [0068].

In contrast, Jackson merely describes an alignment system using LEDs to emit visible light on target, and Butler discusses only a wheel alignment system that uses both visible and non-visible light emitting diodes for determining relative positions between wheels. Neither Jackson nor Butler

teaches providing a target indicator that displays a status of target acquisition indicating whether an obtained image of the scannable target device is acceptable, as described in claim 13. Therefore, Jackson and Butler, even combined, do not teach “a target object indicator that displays the status of target acquisition..., wherein the status of target acquisition indicates whether an obtained image of the scannable target device is acceptable,” as recited in claim 13. Accordingly, Jackson and Butler cannot support a prima facie case of obviousness. The obviousness rejection of claim 13 based on Jackson and Butler is untenable and should be withdrawn. Favorable reconsideration of claim 13 is respectfully requested.

The Obviousness Rejection Based on Jackson, Butler and Stam Is Traversed

Claim 10 was rejected as being obvious over Jackson and Butler and further in view of Stam. The obviousness rejection is respectfully traversed because Jackson, Butler and Stam cannot support a prima facie case of obviousness.

Claim 10 depends on claim 1 and further describes that the image sensing device is a complimentary metal oxide semiconductor (CMOS) camera. As discussed earlier, both Jackson and Butler fail to teach a visible indicator for indicating whether the at least one invisible light emitting diode is operating properly, as described in claim 10 through its dependency from claim 1. Stam also fails to teach or suggest this feature. Therefore, Jackson, Butler and Stam, if combined, do not teach every limitation of claim 10. Accordingly, Jackson, Butler and Stam cannot support a prima facie case of obviousness. The obviousness rejection of claim 10 is untenable and should be withdrawn. Favorable reconsideration of claim 10 is respectfully requested.

The Obviousness Rejection Based on Jackson, Butler and Mathes Is Overcome

Claims 14-16 were rejected as being obvious over Jackson and Butler and further in view of Mathes. It is respectfully submitted that the obviousness rejection is overcome because Jackson, Butler and Mathes cannot support a prima facie case of obviousness.

Claims 14-16, directly or indirectly, depend on claim 13 and incorporate every limitation thereof. As discussed earlier, neither Jackson nor Butler teaches “a target object indicator that displays the status of target acquisition..., wherein the status of target acquisition indicates whether an obtained image of the scannable target device is acceptable,” as required by claims 14-16 through their respective dependencies of claim 13. Although Mathes discusses using 7-segment LED display 36-1, 36-2 and LED indicators 35-1 and 35-2 to indicate weights to be added to a wheel and the direction to rotate the wheel, Mathes does not teach providing a target indicator for indicating whether an obtained image of the scannable target device is acceptable, as described in claims 14-16. Accordingly, even if Jackson, Butler and Mathes are combined, the references do not teach every limitation of claims 14-16 and cannot support prima facie case of obviousness. Therefore, the obviousness rejection of claims 14-16 based on Jackson, Butler and Mathes is untenable and should be withdrawn. Favorable reconsideration of claims 14-16 is respectfully requested.

New Claims 26-28 Are Patentable

By this Response, claims 26-28 are newly presented. Claim 26 describes An image-based position determination system for optically scanning a target device related to an object in order to determine the orientation of the object. The system includes an image sensing device configured to view the target device and to generate image information indicative of geometric characteristics of the target device, and at least one light emitting diode for emitting strobed light thereby illuminating the target device such that the light is retro-reflected to the image sensing device, and the image

sensing device detects and forms an image of the target. The system further includes a visual indicator for indicating a direction by which the object should be moved relative to the image sensing device. A data processing device is provided to determine the orientation of the object based on the generated target image. Claim 27 is a means-plus-function claim that includes descriptions comparable to those of claim 26. Appropriate support for the new claims can be found in, for example, Figs. 1, 6 and 7; and paragraph [0069].

As discussed earlier, Jackson merely describes an alignment system using LEDs to emit visible light on target, and Butler only discusses a wheel alignment system that uses both visible and non-visible light emitting diodes for determining relative positions between wheels. Neither Jackson nor Butler teaches or suggests an image-based position determination system for optically scanning a target device related to an object in order to determine the orientation of the object, that includes a visual indicator for indicating a direction by which the object should be moved relative to the image sensing device, as described in claims 26 and 27.

Although Mathes discusses using 7-segment LED display 36-1, 36-2 and LED indicators 35-1 and 35-2 to indicate *a direction to rotate a wheel, i.e., clockwise or counterclockwise*, Mathes does not disclose that the LEDs indicate a direction by which the object should be moved relative to the image sensing device, as described in claims 26 and 27. Other references of record also fail to teach these features. Therefore, claims 26 and 27 are patentable over the references of record and in condition for allowance. Favorable consideration of claims 26 and 27 is respectfully requested.

New claim 28 depends on claim 13 and incorporates every limitation thereof. As discussed earlier, claim 13 is allowable over the references cited in the Office Action. Therefore, claim 13 is also allowable by virtue of its dependency on claim 13 as well as based on its own merits. Favorable reconsideration of claim 13 is respectfully requested.

Conclusion

For the reasons given above, Applicants believe that this application is conditioned for allowance and Applicants request that the Examiner give the application favorable consideration and permit it to issue as a patent. However, if the Examiner believes that the application can be put in even better condition for allowance, the Examiner is invited to contact Applicants' representatives listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT WILL & EMERY LLP

A handwritten signature in black ink, reading "Wei-Chen Nicholas Chen". The signature is written in a cursive, flowing style.

Wei-Chen Nicholas Chen

Recognized under 37 CFR §10.9(b)

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